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EXAMINER	
CRAIG, DWIN M	

ART UNIT	PAPER NUMBER
2123	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/720,714	BAUM ET AL.	
	Examiner	Art Unit	
	DWIN M. CRAIG	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-12,14-20,22-29,31-46,48-54 and 56-61* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1, 3-12, 14-20, 22-29, 31-46, 48-54 and 56-61* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1, 3-12, 14-20, 22-29, 31-46 and 48-54 have been presented fro reconsideration based on Applicants' amended claim language and arguments. Claims 56-61 have been presented for examination.

Response to Arguments

2. Applicants' arguments presented in the 4/9/2008 responses have been fully considered; the Examiner's response is as follows:

On page 15 of the 4/9/2008 response Applicants' responded to the objections to claims 2, 9, 21, 26 and 43, as noted by the Applicants' the objections to claims 2 and 21 are moot, further the Examiner thanks the Applicants' for amending claims 9, 26 and 43 and therefore the previously applied objections to those claims has been withdrawn.

2.1 As regards the Applicants' response to the 35 U.S.C. § 103(a) rejections of claims 1-55, on page(s) 15 and 16 of the 4/9/2008 responses Applicants' argued;

As now amended, independent Claim 1 describes a method for automatically generating a subset of components from a plurality of components. The method of independent Claim 1 receives a request to generate a subset of components, accesses connectivity data including information regarding the plurality of components and the connections among the plurality of components and automatically selects portions of the connectivity data that satisfy the request to generate the subset of components. As now amended, independent Claim 1 further defines the method to include "generating a diagram based upon the automatically selected portions of the connectivity data of only the subset of components without other components from the plurality of components that are not included in the subset of components; and displaying a diagram of only the subset of components without other components from the plurality of components that are not included in the subset of components."

The Examiner has found this argument, in view of the instant amendments to the claims, to be persuasive and hereby withdraws the earlier 35 U.S.C. 103(a) rejections of claims 1-55.

More specifically, the Examiner notes that the previously applied prior art references, *Baum et al.* and *Boose et al.* fail to teach the specific limitations of, "*generating a diagram based upon the automatically selected portions of the connectivity data of only the subset of components without other components from the plurality of components that are not included in the subset of components; and displaying the diagram of only the subset of components without other components from the plurality of components that are not included in the subset of components*".

Applicant's arguments, see pages 15-18, filed 4/9/2008, with respect to the rejection(s) of claim(s) 1-55 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is being made in view of U.S. Patent 7,065,476 to Dessureault et al.

2.2 As regards dependent claims 10, 27 44 and 50 on page 19 of the 4/9/2008 responses Applicants' argued;

For example, dependent Claims 10, 27, 44 and 50 further recite the removal of at least one component from the automatically selected portions of the connectivity data that satisfy the request for the subset of components followed by the direct connection of the components that were previously attached to a removed component prior to generating the diagram of the subset of components. The Official Action does not cite to either Baum et al. or Boose et al. in conjunction with dependent Claims 10, 27, 44 and 50, but, instead asserts that "it would have been obvious to an artisan of ordinary skill, at the time of the invention, to update the schematic wiring diagrams when, during the course of maintenance and repair, a part has been removed." Dependent Claims 10, 27, 44 and 50 are not directed to the instance in which an actual part has been physically removed during maintenance and repair as suggested by the Official Action. Instead, dependent Claims 10, 27, 44 and 50 are directed to instances in which a subset of components is initially generated that satisfy the request based upon the connectivity date and the user, for example, then removes one or more components from the subset of components which will be displayed (thereby removing the displayed representation of the component but not the physical component itself). As such, the user merely further simplifies the displayed subset by removing one or more components that otherwise would be included in the subset as a result of the request and the connectivity data. By simplifying the display of the subset of components in this fashion, the component is not actually removed from the physical circuit, but the display of the circuit is simply modified to no longer illustrate the removed component.

The Examiner respectfully traverses Applicant's argument, the arguments and rejections as set forth in the Office Action dated 1/9/2008 are maintained by the Examiner. The Applicants' have argued that, *for example, then removes one or more components from the subset of components which will be displayed (thereby removing the displayed representation of the component but not the physical component itself)* the Examiner has applied a reasonably broad interpretation to the claim language and the current claim language fails to teach that the actual physical component is not removed, therefore Applicants' are arguing a limitation that the current claim language does not posses. As regards the limitation as to the generating of a diagram of the subset of components, selecting subsets of components in CAD packages and then displaying just that subset is not only obvious, but well known in the CAD art. Specifically the Examiner maintains that it would have been obvious, at the time of the invention, to an artisan of ordinary skill, to have *updated* a CAD system with the insertion or deletion of a new component and all of the connectivity data required for said component. For example, U.S. Patent 7,065,476 to Dessureault et al. clearly teaches that level of skill of an artisan of ordinary skill, at the time of Applicants' invention would know to *update* all of the connectivity information and the relationship of a particular part in a subsystem with the information required to assure that the schematics reflect the current state of a subsystem, see Figure(s) 7 and 10 and Col. 5 lines 42-53 more specifically, "…Additionally, designers/engineers are able to easily move whole branches of the system, re-route the paths, resize the paths, and update components based on engineering specifications and basic rules (e.g. duct size calculations)..." and further see also Col. 8 lines 3-29 more specifically, "…Display representations are highly flexible and customizable to support product localization, manufacturers, and end-user customization…" and

starting in Col. 8 line 15, ""Such multiple display representation support allows the user to only place one part and use the part for multiple purposes while minimizing redundant data…". As shown in the *Dessureault et al.* teaching, the method of updating a display of a schematic when a component is removed or updated is well known in the CAD art.

2.3 On page 20 of the 4/9/2008 responses Applicants' further argued;

Additionally, dependent Claims 11, 28 and 45 further define the request for a subset of components to include at least one of "a maximum number of components and a maximum number of connections" with the subset of components that is subsequently identified satisfying these constraints. The Official Action does not cite either Baum et al. or Boose et al., but instead states that "it would have been obvious to an artisan of ordinary skill, at the time of the invention, to provide for boundary conditions in the search for components, because if a search was failing the system need a mechanism to halt an endless search that will never produce a termination condition." By specifying a maximum number of components and/or the maximum number of connections in the request for a subset of components, dependent Claims 11, 28 and 45 permit the subset of components be defined in such a way as to be manageable and readily reviewable by the user. To the contrary, the rationale that even in the absence of any relevant disclosure by Baum et al. or Boose et al. it would have been obvious for a request for a subset of components to include the maximum number of components and/or the maximum number of connections as set forth by dependent Claims 11, 28 and 45 is misplaced in that the subset of components as requested by dependent Claims 11, 28 and 45 is not boundless, but is bounded in various manners as defined by the connectivity data. As such, there is not otherwise a necessity for bounding the request and, indeed, it would appear as though instances in which the request produced an endless search would be of interest since it may indicate error in the circuit design or layout.

The Examiner respectfully traverses Applicants' arguments, an artisan of ordinary skill would understand the need to automate the process of performing a design rules checking function. For example, *satisfying constraints* is another way of saying that a design rules check is being performed on a particular subsystem, U.S. Patent 7,065,476 to Dessureault et al. clearly teaches that design rules checks are often performed on subsystems in a complex design environment, see U.S. Patent 7,065,476 to Dessureault et al. which clearly teaches, Col. 2 line 25, "Such connection capabilities may also be further enhanced with connection rules that only

allow valid subsystem connections." In other words, the design is checked to make certain that the current design *satisfies constraints*¸ *Dessureault et la.* further teaches, Col. 5 line 42-45, "Additionally, designers/engineers are able to easily move whole branches of the system, re-route the paths, resize the paths and updated components based on engineering specifications and basic rules…" and this is performed for the exact same types of electrical systems as claimed by Applicant's, see Col. 6 line 43, "Other supported systems may include electrical (wiring of both residential and commercial buildings), telephone & computer networks (communications wiring to support telephone and computer networks throughout home or office), lighting design, energy simulation…" and further that the design rules checking for specific components in specific configurations, see Col. 7 line 39 "Connectivity enables each component **400-406** to connect itself to a network based on logical rules of subsystem type and connection profile. Parts/components **400-406** are connected into systems through connectors. Further, the connected systems may be created automatically based on user configuration rules." Therefore, checking for maximums and minimums with an automated design rules check is well within the knowledge of an artisan of ordinary skill and would therefore be obvious.

On page(s) 20 and 21 Applicants' further argued;

Dependent Claims 12, 29 and 46 recite that the request for subset of components requests that the subset of components include a path that is located at a predefined distance away from a respective component. The Official Action contends that Baum et al. reads upon dependent Claims 12, 29 and 46 as a result of the distance between components depicted in Figure 5. While Figure 5 does depict various components spaced from one another by various distances, neither Baum et al. nor Boose et al. teaches or suggests that a request for the display of a subset of components requests that the subset of components includes a path located a predefined distance away from a respective component as set forth by dependent Claims 12, 29 and 46. Indeed, there is no discussion by either of the cited references as to any path that is within a predefined distance of a component.

The Examiner respectfully traverses Applicants' argument, the cited figure in *Baum et al.* clearly teaches a distance between components clearly the diagram is to scale and therefore there is a clear teaching of distances between components. As regards a discussion of a path to a predefine component, the reference doesn't need to have a discussion, the figure clearly teaches the concept because it is obviously a scale drawing.

As regards claims 14, 32 and 49, on page 21 of the 4/9/2008 responses Applicants' argued;

Dependent Claims 14, 32 and 49 are directed to the addition of a component to a subset of components after the diagram of the subset of components has been generated, followed by the regeneration of a diagram including the added component. Similarly, dependent Claims 15, 33 and 50 are directed to the removal of a component to a subset of components after the diagram of the subset of components has been generated, followed by the regeneration of a diagram without the removed component. Among other applications, such re-generation of a diagram following the addition or deletion of a component can be useful in instances in which an airline has added or removed a component after receiving an aircraft such that the drawings generated by the aircraft manufacturer are otherwise outdated since they would include the added or removed component. In contrast, neither Boose et al. nor Baum et al. teaches or suggests the addition or removal of a component and the re-generation of a diagram as set forth by these dependent claims.

The Examiner respectfully traverses Applicants' arguments; again the Applicants' are arguing that *updating* a drawing to reflect a change is novel. Specifically the Examiner maintains that it would have been obvious, at the time of the invention, to an artisan of ordinary skill, to have *updated* a CAD system with the insertion or deletion of a new component and all of the connectivity data required for said component. For example, U.S. Patent 7,065,476 to Dessureault et al. clearly teaches that level of skill of an artisan of ordinary skill, at the time of Applicants' invention would know to *update* all of the connectivity information and the relationship of a particular part in a subsystem with the information required to assure that the schematics reflect the current state of a subsystem, see Figure(s) 7 and 10 and Col. 5 lines 42-53

more specifically, "…Additionally, designers/engineers are able to easily move whole branches of the system, re-route the paths, resize the paths, and update components based on engineering specifications and basic rules (e.g. duct size calculations)..." and further see also Col. 8 lines 3-29 more specifically, "…Display representations are highly flexible and customizable to support product localization, manufacturers, and end-user customization…" and starting in Col. 8 line 15, ""Such multiple display representation support allows the user to only place one part and use the part for multiple purposes while minimizing redundant data…". As shown in the *Dessureault et al.* teaching, the method of updating a display of a schematic when a component is removed or updated is well known in the CAD art.

As regards claims 16-19, 34-37 and 51-54, on page 21 of the 4/9/2008 responses, Applicants' argued;

Dependent Claims 16-19, 34-37 and 51-54 are directed to a request for the subset of components to be those included in either a repair log or a maintenance procedure. While Boose et al. does note that aircraft require extensive maintenance documentation, neither Boose et al. nor Baum et al. teaches or suggests a request for a subset of components to include those in a repair log or a maintenance procedure and to then generate a diagram of the subset of components including those in a repair log or maintenance procedure as recited by dependent Claims 16, 17, 34, 35, 51 and 52.

The Examiner notes that on page 294 of *Baum et al.* in the third paragraph is recited, "A path through the diagram will ultimately lead to a *fault code* which should be entered in the flight logbook." The "flight logbook" is related to the repair log and therefore any fault would lead from the flight logbook to the repair log. This series of events would happen because the maintenance personnel would reference the flight log in order to know what repairs were required to get the plane air worthy for the next flight. Applicants' are attempting to claim a

methodology regarding the standard practices in air operations, the Examiner respectfully sets forth that this methodology would be known to an artisan of ordinary skill.

On page(s) 21 and 22 of the 4/9/2008 responses Applicant's further argued;

Additionally, new dependent Claims 56, 58 and 60 describe a technique for automatically selecting portions of the connectivity data by: (i) for an initial component in the subset of components, identifying another component connected to the initial component based upon the connectivity data, (ii) adding the other component to the subset of components; and repeating the identifying and adding steps with the other component being the initial component. As set forth by new dependent Claims 57, 59 and 61, the process may be terminated upon the satisfaction of a predetermined condition, such as the attempted inclusion of a component that is already in the subset of components. Neither Boose et al. nor Baum et al. teaches or suggests the techniques for automatically selecting portions of the connectivity data set forth by new dependent Claims 56-61.

In this office action the Examiner will provide a response to the newly presented claims as to patentability.

On page 22 of the 4/9/2008 Applicants' argued;

For each of the foregoing reasons, at least the dependent claims identified above include additional recitations that are also not taught or suggested by the cited references, taken either individually or in combination, and, as such, are further patentably distinct from the cited references. As noted above, the Official Action does not cite to either Baum et al. or Boose et al. in conjunction with a rejection of several of the dependent claims and, instead, merely alleges that one skilled in the art would find the additional recitation introduced by the dependent claim to be obvious. To the extent these rejections are premised upon Official Notice, such reliance is seasonably challenged and the Examiner is respectfully requested to identify and cite to a reference if these rejections are to be maintained.

Applicants' have presented newly amended claim language in the response to the Official Action of 1/9/2008. These newly presented claim limitations have required a new prior art search, that search has revealed a reference that teaches and makes obvious the claimed limitations as set forth in the instant claims. More specifically the Examiner is referring to U.S. Patent 7,065,476 to Dessureault et al.

As regards the argument set forth by Applicants' that the previously applied rejections were premised upon Official Notice, the Examiner respectfully traverses this argument. The claimed limitations set forth in dependent claims 10, 11, 12, 14, 16-19, 27, 28, 29, 32, 34-37, 44, 46, 48, 49 and 5-54, there was not need for Official Notice because all of the claimed limitations were within the knowledge of an artisan of ordinary skill at the time of the invention. In the interest of clarity the Examiner has shown teachings in U.S. Patent 7,065,476 to Dessureault et al. in order to provide clear evidence that in fact the cited limitations are well known in the CAD art.

2.4 An updated search, based on Applicants' amended claim language, has revealed new art.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

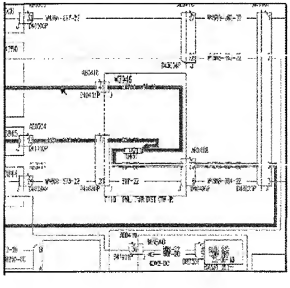
3. Claims 1, 3-12, 14-20, 22-29, 31-46, 48-54 and 56-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Graphics Recognition for a Large-Scale Airplane Information System" hereafter referred to as *Baum et al.* in view of "Interpretation of Technical Illustrations for Airplane Maintenance and Operations Applications, hereafter referred to as *Boose et al.* and in further view of U.S. Patent 7,065,476 to Dessureault et al.

3.1 Regarding independent claims 1, 20 and 38 and using independent claim 1 as an example, *Baum et al.* teaches, *a method for automatically generating a subset of components from a plurality of components comprising: receiving a request to generate a subset of components;* Page(s) 292 and 293 teach;

"For example, suppose that there is a problem in the air conditioning system in the crew rest area of a 757. The mechanic uses the system to go directly from the fault code for that problem to the fault isolation procedure in the Fault Isolation Manual, via a text hyperlink. The procedure references a four-sheet figure containing a fault isolation decision tree. By clicking on hotspots in the graphic, he quickly gets to the corrective action, which is a removal and installation procedure in the Airplane Maintenance Manual. There is a hotspot on that reference,

so he quickly navigates to the correct location in the Maintenance Manual. The procedure requires inspection of a wiring diagram, found in the Wiring Diagram Manual. There is a hyperlink in the Maintenance Manual which takes the mechanic to the correct diagram. Because the graphic viewer traces electrical circuits in the diagram, the mechanic can readily determine the affected components and the associated pin numbers so that removal/installation is done properly. The desired component is not in stock, however, so the mechanic needs to consult the Illustrated Parts Catalog. The component number in the wiring diagram also has a hotspot, so he can go directly from the Wiring Diagram Manual to the desired location in the Illustrated Parts Catalog. The illustrations there are also populated with hotspots so that the mechanic can easily pull up the information as to part number and supplier, so that the part can be obtained as quickly as possible."

Further and in regards to the claimed limitation; *generating a subset of components from a plurality of components*; the illustration on page 297, Figure 3:



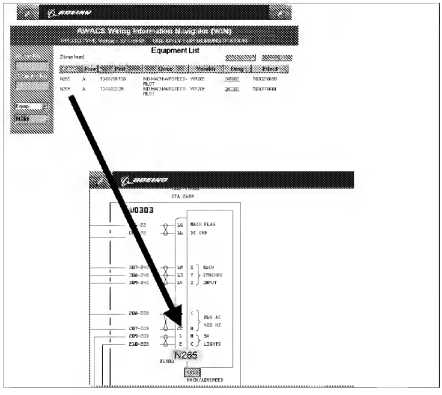
Clearly from the diagram, a copy of which is presented here, a subset of the components is being high lighted and therefore, the generation of a subset of components is being presented.

accessing connectivity data comprising information regarding at least the plurality of components and connections among the plurality of components; (See page 297 the first paragraph, which is repeated here…);

"Component location diagrams provide exploded views of aircraft and their components. Typically one diagram consists of multiple sheets, each of which has one or more subpictures (insets) with internal callout references. Our software must reliably subdivide each image into subpictures and generate the hot spots that link the callouts to the correct subpicture, including references to other sheets. In addition, the software generates hot spots around each equipment number, so that mechanics can easily navigate from the picture to information about that piece of equipment. This manual set contains over 650 vector component location diagrams; the system produced over 3200 subpictures containing over 25,000 hot spots (Figure 2)."

However, *Baum et al.* does not expressly disclose, *and automatically selecting portions of the connectivity data that satisfy the request to generate the subset of components* and as regards the newly amended claim limitations, "*to generating a diagram based upon the automatically selected portions of the connectivity data of only the subset of components without other components from the plurality of components that are not included in the subset of components; and displaying the diagram of only the subset of components without other components from the plurality of components that are not included in the subset of components*".

Boose et al. teaches in Figure 3;



Along with the descriptive text provided in *Boose et al.* the provided example teaches clearly provide a to providing of connection information between the subset of components.

Dessureault et al. clearly teaches, *to generating a diagram based upon the automatically selected portions of the connectivity data of only the subset of components without other components from the plurality of components that are not included in the subset of components; and displaying the diagram of only the subset of components without other components from the plurality of components that are not included in the subset of components* (see Figure(s) 7 and 10 and Col. 5 lines 42-53 more specifically, "…Additionally, designers/engineers are able to easily move whole branches of the system, re-route the paths, resize the paths, and update components

based on engineering specifications and basic rules (e.g. duct size calculations)..." and further see also Col. 8 lines 3-29 more specifically, "…Display representations are highly flexible and customizable to support product localization, manufacturers, and end-user customization…" and starting in Col. 8 line 15, ""Such multiple display representation support allows the user to only place one part and use the part for multiple purposes while minimizing redundant data…". More specifically and in regards to displaying a specific subsystem see Col. 1 lines 34-40, "A CAD system may be further utilized to display different systems or subsystems. For example, a CAD program may be used to display a plumbing system model, a fire protection system model, sewer piping, an HVAC ductwork model, electrical single-line and multi-line schematics, electrical power and lighting models, electrical cable tray models…" it is noted that this description specifically states that each of these subsystems are being generated and displayed and that the other subsystems are not being displayed, to support this position the Examiner points to Col. 8 lines 3-18 more specifically, "Display representations are highly flexible and customizable to support localization, manufacturers, and end-user customization." And further on line 14, "…schematic representation for diagrams…" therefore in view of the teachings as set forth, it would be obvious, to an artisan of ordinary skill to create a *diagram of only the subset of components without other components from the plurality of components that are not included in the subset of components*).

Baum et al., *Boose et al.* and *Dessureault et al.* are analogous art because they all come from the same problem solving area of navigation of complex component data in a context sensitive manner and the Computer Aided Design technologies.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have provided connection information between subcomponents of a subgroup and to then further display a *subsystem* containing only those components selected fro said subsystem.

The motivation for doing so would have been to provide maintenance Aids to older aircraft and provide for a system and a method to facilitate more efficient repair and maintenance of aircraft, see page the last page of *Boose et al.* a portion of which is repeated here;

"Our wiring diagram methodology works for vector diagrams, but there are hundreds of thousands of legacy illustrations in raster. If we had reliable raster-to-vector conversion software, we could convert those diagrams to intelligent wiring diagrams as well, enabling Boeing to provide maintenance aids for older aircraft as well. Such raster-to-vector conversion software must reliably find lines, circles, and circular arcs, and correctly perform optical character recognition on all the text in the diagram. The input would be very clean raster images with machine-printed characters."

It is further noted that the *Baum et al.* reference is listed in the *Boose et al.* reference.

Further and in regards to the motivation to combine the teachings of *Baum et al.* and *Boose et al.* with the teachings of *Dessureault et al.* at the time the invention was made, it would have been obvious to an artisan of ordinary skill to use the teachings, as set forth in *Dessureault et al.* because, as disclosed in Col. 2 lines 19-29 of *Dessureault et al.* the ability to eliminate duplicate representations and further having parts that are adaptable and learn design characteristics through the design cycle and then having the capability to recognize subsystems and automatically connect to other subsystems and being further enhanced using connection

rules that valid subsystem connections are being made, would in combination, motivate an artisan of ordinary skill to use the teachings of *Dessureault et al.*

Therefore, it would have been obvious to combine *Boose et al.* with *Baum et al.* and *Dessureault et al.* to obtain the invention as specified in claims 1, 3-12, 14-20, 22-29, 31-46, 48-54 and 56-61.

3.2 As regards dependent claim 3, *Baum et al.* does not expressly teach, *wherein receiving a request comprises receiving a unique name of at least one component desired in the subset of components* however, *Boose et al.* teaches (Figure 1 "CLUTCH SAFETY SWITCHES", "TORQUE MODULATION SWITCH NO 1").

3.3 As regards dependent claim 4, *Baum et al.* does not expressly teach, *wherein receiving a request comprises receiving a description of at least one component desired in the subset of components* however, *Boose et al.* teaches (Figure 1 which discloses descriptions, see also the descriptive text).

3.4 As regards dependent claims 5, 22 and 39 and using dependent claim 5 as an example, *Baum et al.* teaches, *wherein receiving a request comprises receiving a request for the subset of components that connect at least two other components, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that create at least one path between the at least two other components* (the illustration on page 297, Figure 3).

3.6 As regards dependent claims 6, 23, 24, 40 and 41 and using dependent claim 5 as an example, *Baum et al.* teaches, *wherein receiving a request comprises receiving a request for the subset of components that connect a source component to a sink component, and wherein*

automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that create at least one path between the source component and the sink component (the illustration on page 297, Figure 3 the electrical components have a starting point "source" and an ending point "sink").

3.7 As regards dependent claim 7, *Baum et al.* teaches; *wherein receiving a request comprises receiving a request for the subset of components that connect a respective component to at least one of a source component and a sink component, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that create at least one path between the respective component and at least one of the source component and the sink component* (the illustration on page 297, Figure 3 the high-lighted path is the *one path*).

3.8 As regards dependent claims 8, 25 and 42 and using dependent claim 8 as an example, *Baum et al.* teaches; *wherein receiving a request comprises receiving a request for the subset of components that comprises at least one of an Airline Transport Association (ATA) system and a Unified Numbering System (UNS), and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that include the components of the at least one of the ATA system and the UNS and that create at least one path among the components of the at least one of the ATA system and the UNS*, (page 291 and page 301).

3.9 As regards dependent claims 9, 26 and 43 and using dependent claim 9 as an example, *Baum et al.* teaches, *wherein receiving a request comprises receiving a request for the subset of components that comprises at least one figure-sheet set specification, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data*

that include the components of the at least one figure sheet set specification and that create at least one path among the components of the at least figure sheet set specification (page 297 the first paragraph, which is repeated here…);

"Component location diagrams provide exploded views of aircraft and their components. Typically one diagram consists of multiple sheets, each of which has one or more subpictures (insets) with internal callout references. Our software must reliably subdivide each image into subpictures and generate the hot spots that link the callouts to the correct subpicture, including references to other sheets. In addition, the software generates hot spots around each equipment number, so that mechanics can easily navigate from the picture to information about that piece of equipment. This manual set contains over 650 vector component location diagrams; the system produced over 3200 subpictures containing over 25,000 hot spots (Figure 2)."

3.10 As regards dependent claims 10, 27, 44 and 50 *Baum et al.* does not expressly disclose, *removing at least one component from the automatically selected portions of the connectivity data that satisfy the request for the subset of components; and directly connecting the components that attach to a removed component prior to generating the diagram of the subset of components.*

However, in view of the methodologies disclosed in the combined teachings, it would have been obvious to an artisan of ordinary skill, at the time of the invention, to *update* the schematic wiring drawings when, during the course of maintenance and repair, a part had been removed.

3.11 As regards dependent claims 11, 28 and 45, *Baum et al.* does not expressly disclose, *wherein receiving a request comprises receiving a request for the subset of components that*

comprises at least one of a maximum number of components and a maximum number of connections, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that satisfy the at least one requested maximum number of components and maximum number of connections.

However in view of the methodologies disclosed in the combined teachings, it would have been obvious to an artisan of ordinary skill, at the time of the invention, to provide for boundary conditions in the search for components, because if a search was failing, the system would need a mechanism to halt an endless search that will never produce a termination condition. Further and in regards to the claimed method of checking maximums and minimums, this is known in the CAD art as *design rules checking* which would be well known to an artisan of ordinary skill. For example, *satisfying constraints* is another way of saying that a design rules check is being performed on a particular subsystem, U.S. Patent 7,065,476 to Dessureault et al. clearly teaches that design rules checks are often performed on subsystems in a complex design environment, see U.S. Patent 7,065,476 to Dessureault et al. which clearly teaches, Col. 2 line 25, "Such connection capabilities may also be further enhanced with connection rules that only allow valid subsystem connections." In other words, the design is checked to make certain that the current design *satisfies constraints, Dessureault et la.* further teaches, Col. 5 line 42-45, "Additionally, designers/engineers are able to easily move whole branches of the system, re-route the paths, resize the paths and updated components based on engineering specifications and basic rules..." and this is performed for the exact same types of electrical systems as claimed by Applicant's, see Col. 6 line 43, "Other supported systems may include electrical (wiring of both residential and commercial buildings), telephone & computer networks (communications wiring

to support telephone and computer networks throughout home or office), lighting design, energy simulation…" and further that the design rules checking for specific components in specific configurations, see Col. 7 line 39 "Connectivity enables each component **400-406** to connect itself to a network based on logical rules of subsystem type and connection profile. Parts/components **400-406** are connected into systems through connectors. Further, the connected systems may be created automatically based on user configuration rules." Therefore, checking for maximums and minimums with an automated design rules check is well within the knowledge of an artisan of ordinary skill and would therefore be obvious.

3.12 Regarding dependent claims 12, 29 and 46, *Baum et al.* teaches; *wherein receiving a request comprises receiving a request for the subset of components that comprise a path that is located a predefined distance away from a respective component, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that include the path that is located the predefined distance away from the respective component* (Figure 5 on page 298 shows distance between the components).

3.13 Regarding dependent claim 31 , *Baum et al.* teaches, *wherein said processing element comprises said generation element* (Figure 4 on page 297, see also Page 297, second paragraph; "Component index tables are vector drawings that tell the mechanic where to go to find the maintenance procedures for the equipment illustrated in the component location drawings. The index table recognizer determines the individual table cells and relationships among cell contents. It generates over 14,000 hot spots in over 300 tables linking the drawings to component location diagrams, other component index tables and to maintenance procedures.").

3.14 Regarding claims 14, 32 and 49, *Baum et al.* teaches, *comprising adding at least one*

component to the subset of components after generating the diagram of the subset of components and re-generating a diagram of the subset of components including the at least one added component. Page 297, second paragraph;

"Component index tables are vector drawings that tell the mechanic where to go to find the maintenance procedures for the equipment illustrated in the component location drawings. The index table recognizer determines the individual table cells and relationships among cell contents. It generates over 14,000 hot spots in over 300 tables linking the drawings to component location diagrams, other component index tables and to maintenance procedures."

3.15 Regarding dependent claims 15 and 33 and using claim 15 as an example, *Baum et al.* teaches, *removing at least one component from the subset of components after generating the diagram of the subset of components and re-generating a diagram of the subset of components without the at least one removed component.*

Page 297, second paragraph;

"Component index tables are vector drawings that tell the mechanic where to go to find the maintenance procedures for the equipment illustrated in the component location drawings. The index table recognizer determines the individual table cells and relationships among cell contents. It generates over 14,000 hot spots in over 300 tables linking the drawings to component location diagrams, other component index tables and to maintenance procedures."

If a component is changed the software would *re-generate* the drawings as required.

3.16 Regarding dependent claims 16, 34 and 51, and using claim 16 as an example, *Baum et al.* does not expressly disclose, *wherein receiving a request comprises receiving a request for the subset of components included in a repair log, and wherein automatically selecting portions of*

the connectivity data comprises selecting portions of the connectivity data that include the components included in the repair log.

However, *Boose et al.* suggests that repair logs data would be required for maintenance of older aircraft, see the first page, portions of which are presented here;

"Modern commercial and military aircraft require extensive maintenance and operations documentation. Traditionally, this has been in the form of multiple paper (or microfiche) manuals encompassing millions of pages including hundreds of thousands of technical illustrations. Much of the critical information that the technician needs to perform his or her task is exclusively located in the illustrations, so that the majority of time spent with the manuals is devoted to accessing and studying illustrations."

3.17 Regarding dependent claims 17, 35 and 52, and using claim 17 as an example, *Baum et al.* does not expressly disclose, *wherein automatically selecting portions of the connectivity data further comprises selecting portions of the connectivity data that create at least one path among the components included in the repair log.*

However, *Boose et al.* suggests that repair logs data would be required for maintenance of older aircraft, see the first page, portions of which are presented here;

"Modern commercial and military aircraft require extensive maintenance and operations documentation. Traditionally, this has been in the form of multiple paper (or microfiche) manuals encompassing millions of pages including hundreds of thousands of technical illustrations. Much of the critical information that the technician needs to perform his or her task is exclusively located in the illustrations, so that the majority of time spent with the manuals is devoted to accessing and studying illustrations."

3.18 Regarding dependent claims 18, 36 and 53, and using dependent claim 18 as an example, *Baum et al.* does not expressly disclose, *wherein receiving a request comprises receiving a request for the subset of components included in a maintenance procedure, and wherein automatically selecting portions of the connectivity data comprises selecting portions of the connectivity data that include the components included in the maintenance procedure.*

However, *Boose et al.* suggests that repair logs data would be required for maintenance of older aircraft, see the first page, portions of which are presented here;

"Modern commercial and military aircraft require extensive maintenance and operations documentation. Traditionally, this has been in the form of multiple paper (or microfiche) manuals encompassing millions of pages including hundreds of thousands of technical illustrations. Much of the critical information that the technician needs to perform his or her task is exclusively located in the illustrations, so that the majority of time spent with the manuals is devoted to accessing and studying illustrations."

3.19 Regarding dependent claims 19, 37 and 54, and using claim 19 as an example, *Baum et al.* does not expressly disclose, *wherein automatically selecting portions of the connectivity data further comprises selecting portions of the connectivity data that create at least one path among the components included in the maintenance procedure.*

However, *Boose et al.* suggests that repair logs data would be required for maintenance of older aircraft, see the first page, portions of which are presented here;

"Modern commercial and military aircraft require extensive maintenance and operations documentation. Traditionally, this has been in the form of multiple paper (or microfiche) manuals encompassing millions of pages including hundreds of thousands of technical

illustrations. Much of the critical information that the technician needs to perform his or her task is exclusively located in the illustrations, so that the majority of time spent with the manuals is devoted to accessing and studying illustrations."

As well as figures 1 and 3 and the descriptive text.

3.20 Regarding dependent claim 48, *Baum et al.* teaches software, see figure 10 and *Boose et al.* teaches the use of software see the last page of *Boose et al.* a portion of which is repeated here;

"Our wiring diagram methodology works for vector diagrams, but there are hundreds of thousands of legacy illustrations in raster. If we had reliable raster-to-vector conversion software, we could convert those diagrams to intelligent wiring diagrams as well, enabling Boeing to provide maintenance aids for older aircraft as well. Such raster-to-vector conversion software must reliably find lines, circles, and circular arcs, and correctly perform optical character recognition on all the text in the diagram. The input would be very clean raster images with machine-printed characters."

It would have been obvious to an artisan of ordinary skill, at the time the invention was made, to have the software be *modular* and have one executable portion, *or module* encompass another executable portion.

3.21 As regards newly presented claims 56, 58 and 60 and using claim 56 as an example, *Baum et al.* does not expressly disclose, *wherein automatically selecting portions of the connectivity data comprises: for an initial component in the subset of components, identifying another component connected to the initial component based upon the connectivity data; adding*

the other component to the subset of components; and repeating the identifying and adding steps with the other component being the initial component.

However, *Dessureault et al.* teaches, Figures 8 and 10 and the descriptive text, more specifically Col. 2 lines 25-27, "Such connection capabilities may also be further enhanced with connection rules that only allow valid subsystem connections..." and Col. 5 lines 48-65 and Col. 7 lines 39-67 and Col. 8 lines 1-2 and Col. 8 lines 39-67 and Col. 9 lines 1-12.

3.22 As regards newly presented claims 57, 59 and 61 and using claim 57 as an example, *Baum et al.* does not expressly teach, *wherein automatically selecting portions of the connectivity data further comprises terminating the repeating upon satisfying a predefined condition*, however, this would be obvious to an artisan of ordinary skill to terminate a process and further to provide a condition for terminating a process, this is known as testing during each execution of a loop for the exit condition.

Conclusion

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DWIN M. CRAIG whose telephone number is (571)272-3710. The examiner can normally be reached on 10:00 - 6:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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